AMENDMENTS TO THE CLAIMS:

1-38. (Cancelled).

39. (Currently Amended) A variable speed drive circuit for an electric submersible pump system comprising a pump and a motor for driving the pump, the drive circuit comprising:

variable voltage supply means for supplying a voltage that can be varied as required;

inverter means supplied by said voltage for producing modulated waveforms to drive a plurality of phases of the motor, the modulated waveforms switching ~~that switch~~ between an upper voltage level and a lower voltage level; and

~~drive~~ control means for operating the inverter means ~~to generate cyclically varying waveforms for driving a plurality of phases of the motor, the drive means being operable to produce overmodulation in which the modulated waveforms are~~ so as to over-modulate the inverter means such that each modulated waveform is unable to follow the peak of [[the]] a sinewave or other waveshape that is demanded in simple proportion ~~and in which the modulated waveforms incorporate regions in which the voltage is non-linearly modulated such that~~ and each modulated waveform has extended periods at the upper voltage level and at the lower voltage level, and ~~level; and speed~~ the control means ~~for controlling~~ being operable to control the speed of the motor by varying said voltage supplied by the voltage supply means to the inverter means.

40. (Previously Presented) The drive circuit of claim 39, wherein the drive circuit is adapted to drive all of the phases of the motor simultaneously.

41. (Currently Amended) The drive circuit of claim 39, wherein at lower speeds the ~~speed~~ control means is arranged to control the ~~drive~~ inverter means according to a low speed control mode in which the ~~waveform is~~ waveforms are linearly modulated.

42. (Currently Amended) The drive circuit of claim 39, wherein the drive ~~means~~ circuit is adapted to apply pulse width modulation.

43. (Previously Presented) The drive circuit of claim 39, wherein the variable voltage supply means comprises chopper means for chopping a fixed voltage in a variable time-dependent sequence in order to supply said voltage.

44. (Previously Presented) The drive circuit of claim 43, wherein the chopper means comprises:

capacitance means connected to first and second fixed supply voltage sources; and

selection means for selectively supplying the voltage defined by the first and second fixed supply voltage sources.

45. (Previously Presented) The drive circuit of claim 44, wherein the chopper means is adapted to vary the duty cycle of the selection means to adjust the voltage across the capacitance means.

46. (Previously Presented) The drive circuit of claim 39, wherein the variable voltage supply means comprises a poly-phase boost converter adapted to supply the difference between the upper voltage level and the lower voltage level from a poly-phase supply.

47. (Previously Presented) The drive circuit of claim 39, wherein the variable voltage supply means is adapted to vary its internal frequency with output so as to improve efficiency.

48. (Currently Amended) The drive circuit of claim 39, ~~wherein the drive means comprises~~ further comprising transformer means having a first secondary winding constituting a first fixed supply voltage source and a second secondary winding constituting a second fixed supply voltage source.

49. (Previously Presented) The drive circuit of claim 39, wherein filter means are connected to the inverter means so as to smooth out the transitions between the upper voltage level and the lower voltage level.

50. (Previously Presented) The drive circuit of claim 49, wherein the filter means are adapted to supply substantially sinusoidally varying voltages to the motor.

51. (Previously Presented) The drive circuit of claim 39, further comprising:

means for varying the drive current or voltage supplied to drive the motor with a fixed load while the motor is driven at a fixed speed;

means for monitoring the output power of the circuit during such variation of the drive current or voltage in order to determine the minimum output power required to drive the motor at said fixed speed; and

means for controlling the output power of the circuit in order to minimize the output power of the circuit required to drive the motor at said fixed speed.

52. (Previously Presented) The drive circuit of claim 39, for controlling driving of a permanent magnet motor, further comprising:

means for varying, relative to an estimated rotor position of the motor, the phase of the drive current or voltage supplied by the circuit to drive the motor while said current or voltage is held at a fixed amplitude;

means for monitoring the motor speed during such variation of the drive current or voltage in order to determine the maximum speed at which the motor can be driven by the available output power; and

means for controlling the phase of the drive current or voltage in order to maximize the motor speed.

53. (Currently Amended) A method for varying the speed of an electric submersible pump system comprising a pump and a motor for driving the pump, the method comprising:

supplying a voltage to an inverter, the voltage being variable as required;

using the inverter to produce modulated waveforms for driving a plurality of phases of the motor, the modulated waveforms switching ~~that switch~~ between an upper voltage level and a lower voltage level;

~~operating~~ over-modulating the inverter to generate ~~cyclically varying~~ the modulated waveforms ~~for driving a plurality of phases of the motor, the inverter being operated to provide overmodulation in which the modulated waveforms are~~ such that each modulated waveform is unable to follow the peak of [[the]] a sinewave or other waveshape that is demanded in simple proportion and ~~in which the modulated waveforms incorporate regions in which the voltage is non-linearly modulated~~ such that each modulated waveform has extended periods at the upper voltage level and at the lower voltage level; and

controlling the speed of the motor by varying said voltage supplied to the inverter.